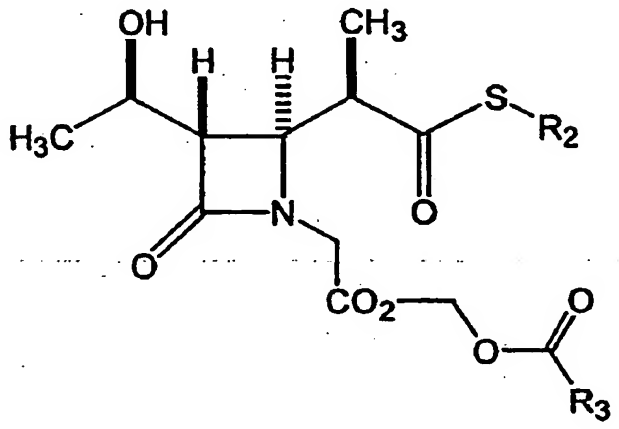
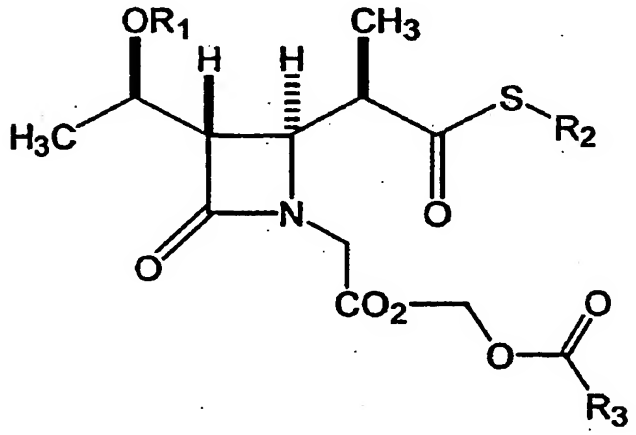
CLAIMS

1. A process for producing a β-lactam compound comprising protecting the hydroxyl group of a compound represented by general formula (1):



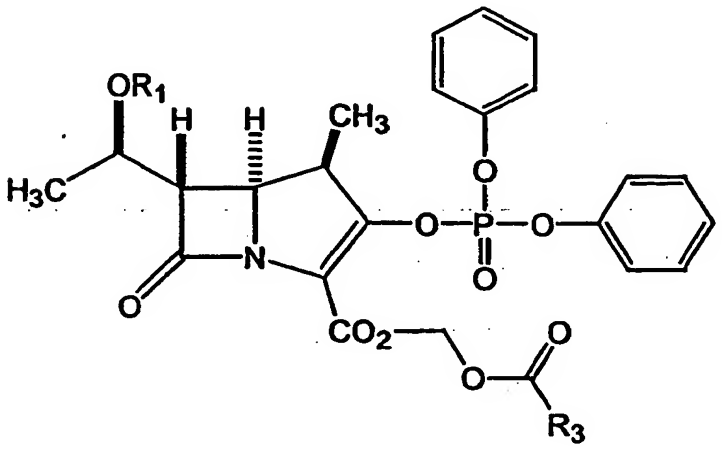
(1)

(wherein R_2 represents an aryl group or a heteroaryl group; and R_3 represents an alkyl group having 1 to 10 carbon atoms or a cycloalkyl group having 3 to 10 carbon atoms), to produce a compound represented by general formula (2):



(2)

(wherein R_1 represents a trimethylsilyl group or a triethylsilyl group; and R_2 and R_3 are the same as above); cyclizing the compound (2) in the presence of a strong base; and subsequently allowing the cyclized compound to react with diphenylphosphoryl chloride to produce a compound represented by general formula (3):



(3)

(wherein R_1 and R_3 are the same as above).

2. The process according to Claim 1, wherein the strong base is a base selected from the group consisting of an alkali metal alkoxide, an alkali metal amide, and an alkali metal hydride.

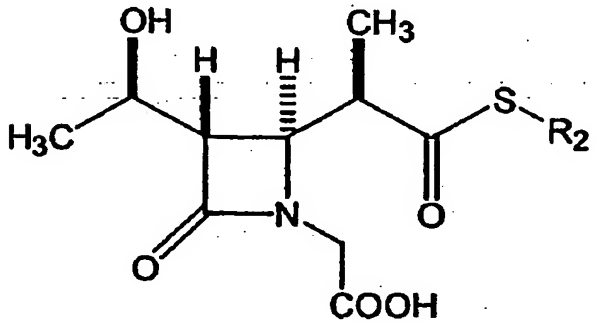
3. The process according to Claim 2, wherein the alkali metal alkoxide is potassium tert-butoxide.

4. The process according to Claim 2, wherein the alkali

metal amide is sodium bis(trimethylsilyl)amide.

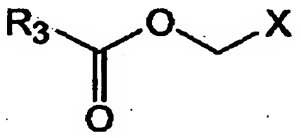
5. The process according to Claim 2, wherein the alkali metal hydride is sodium hydride.

6. The process according to Claim 1, wherein the compound represented by general formula (1) is produced by allowing a compound represented by general formula (5):



(5)

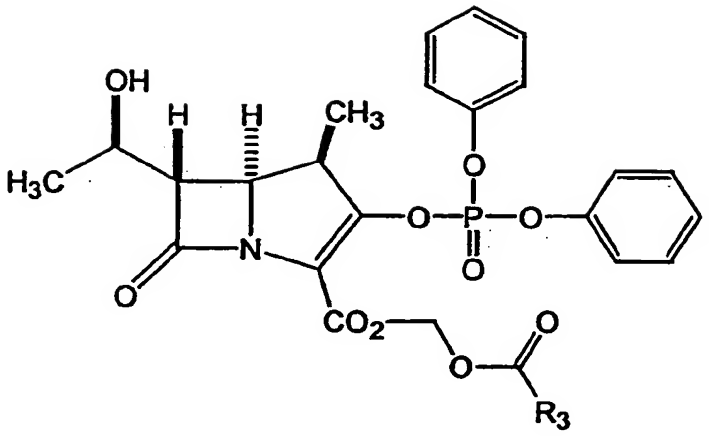
(wherein R_2 represents an aryl group or a heteroaryl group), to react with a compound represented by general formula (6):



(6)

(wherein R_3 represents an alkyl group having 1 to 10 carbon atoms or a cycloalkyl group having 3 to 10 carbon atoms; and X represents a halogen atom), in the presence of a base.

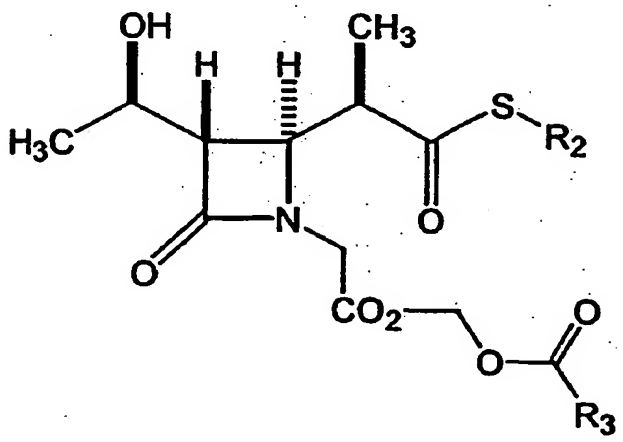
7. A process for producing a β-lactam compound represented by general formula (4):



(4)

(wherein R_3 represents an alkyl group having 1 to 10 carbon atoms or a cycloalkyl group having 3 to 10 carbon atoms), the process comprising deprotecting the hydroxyl moiety of the compound represented by general formula (3) produced by the process according to any one of Claims 1 to 6.

8. A compound represented by general formula (1):



(1)

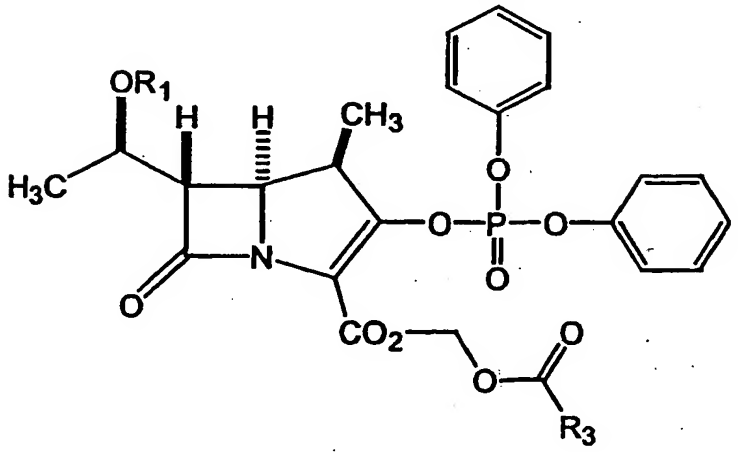
(wherein R_2 represents an aryl group or a heteroaryl group;

and R_3 represents an alkyl group having 1 to 10 carbon atoms or a cycloalkyl group having 3 to 10 carbon atoms).

9. The compound according to Claim 8, wherein R_2 is a phenyl group or a p-chlorophenyl group.

10. The compound according to Claim 8 or 9, wherein R_3 is a tert-butyl group.

11. A compound represented by general formula (3):



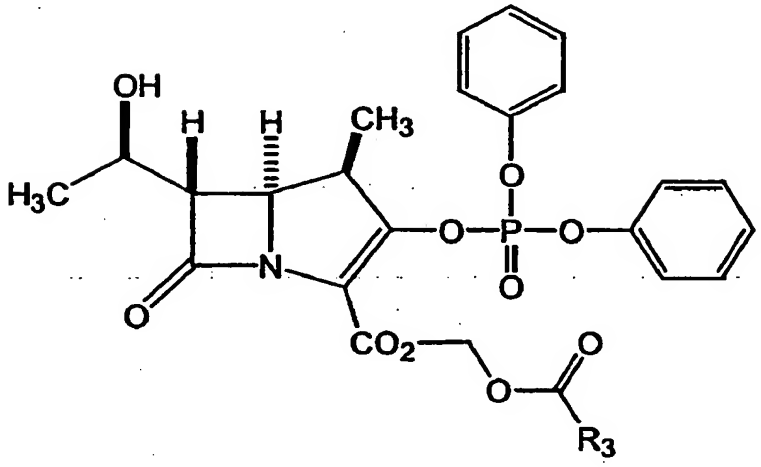
(3)

(wherein R_1 represents a trimethylsilyl group or a triethylsilyl group; and R_3 represents an alkyl group having 1 to 10 carbon atoms or a cycloalkyl group having 3 to 10 carbon atoms).

12. The compound according to Claim 11, wherein R_3 is a tert-butyl group.

13. The compound according to Claim 11 or 12, wherein R_1 is a trimethylsilyl group.

14. A compound represented by general formula (4):



(4)

(wherein R_3 represents an alkyl group having 1 to 10 carbon atoms or a cycloalkyl group having 3 to 10 carbon atoms).

15. The compound according to Claim 14, wherein R_3 is a tert-butyl group.